

1/ 40

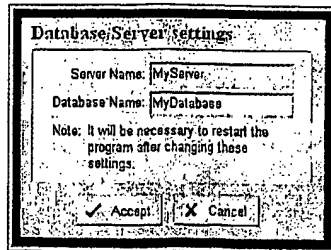


Figure 1

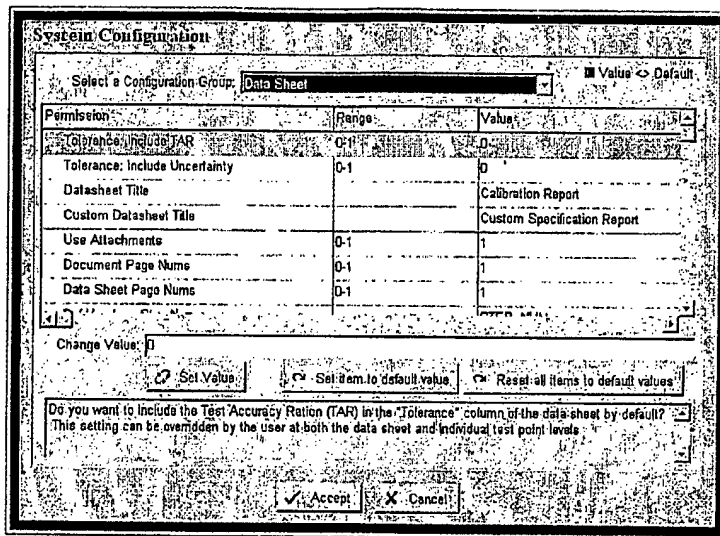


Figure 2

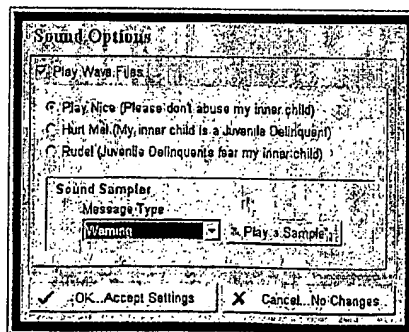


Figure 3

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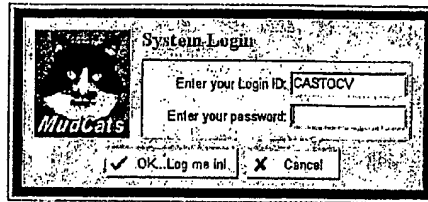


Figure 4

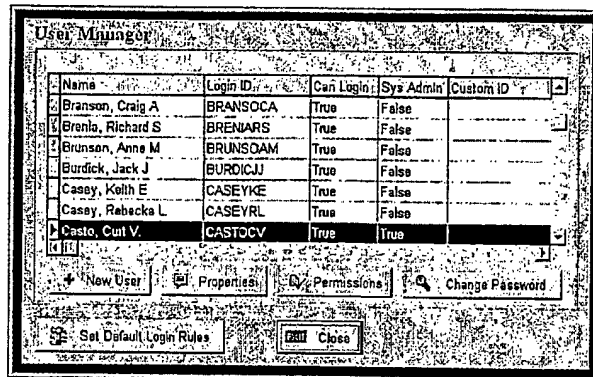


Figure 5

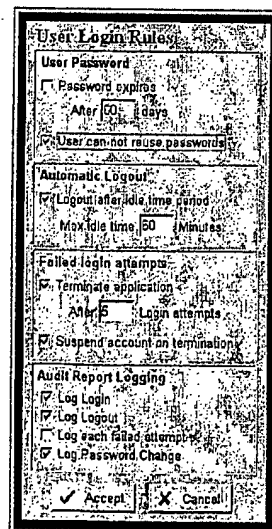
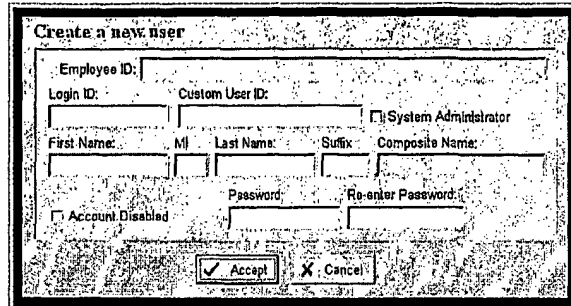


Figure 6

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Create a new user

Employee ID: _____

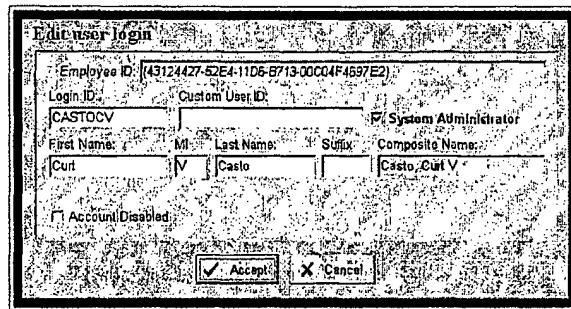
Login ID: _____ Custom User ID: _____ ☐ System Administrator

First Name: _____ MI: _____ Last Name: _____ Suffix: _____ Composite Name: _____

Account Disabled: ☐ Password: _____ Re-enter Password: _____

☒ Accept ☐ Cancel

Figure 7



Edit user login

Employee ID: (43124427-52E4-11D6-B713-00C04F4B97E2)

Login ID: _____ Custom User ID: _____ ☒ System Administrator

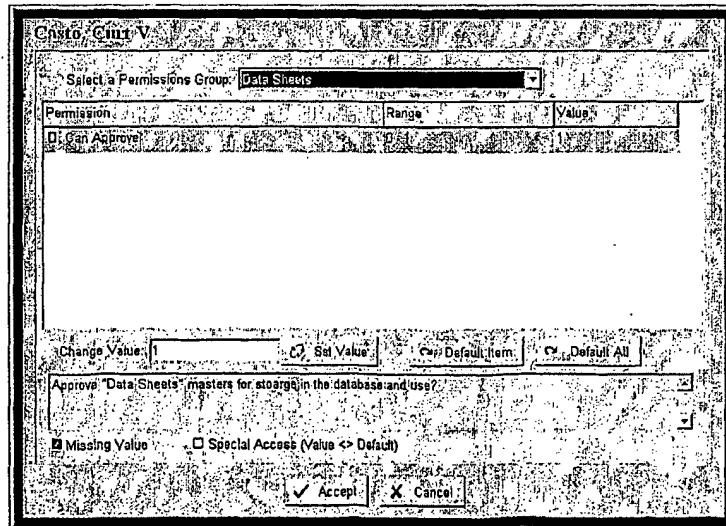
First Name: _____ MI: _____ Last Name: _____ Suffix: _____ Composite Name: _____

Curt _____ V _____ Casio _____ Casio, Curt V _____

Account Disabled: ☐

☒ Accept ☐ Cancel

Figure 8



Casio, Curt V

Select a Permissions Group: Data Sheets

Permission	Range	Value
Can Approve		

Change Value: Set Value Copy Default Item Default All

Approve "Data Sheets" masters for storage in the database and use?

☒ Missing Value ☐ Special Access (Value <> Default)

☒ Accept ☐ Cancel

Figure 9

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Change your password

Enter Old Password: Your new password:

Enter New Password: 1. Must be at least six characters

Reenter New Password: 2. Can not be more than fifteen characters

3. Must be alpha and numeric

4. Can not be identical to your login ID

☒ OK...Change Password ☒ Cancel...Make no changes

Figure 10

MidCat: Audit File Report Selection Criteria

Date Range: This Quarter

From: 4/ 1/2002 To: 6/30/2002

Sort 1: (None) Sort 2: (None) Sort 3: (None) Sort 4: (None)

☒ Show Preview ☐ Print Transaction ID

Selection Fields: LoginIDs

Selected Values: ☒ Clear Selections

☐ BOYDTJ ☐ BRANSOCA ☐ BRENIARS ☐ BRUNSOAM ☐ CASEYKE ☐ CASEYRL ☐ CASTICV ☐ DELEONTW ☒ DIANDRM ☐ ESCUDEJ

Selected Report Options:

☐ Report Options

☐ Date Range: From: 4/1/2002 To: 6/30/2002

☐ Sort By: Trans Date

☐ Applications: [All]

☐ LoginIDs: DIANDRM

☐ Files: [All]

☐ Trans Types: Approval

☐ Retrieve Settings ☐ Save Settings

Figure 11

UUT Boilerplate Setup

Asset No: M1-1294

Test No: B76113

Model: BOEOA

Manufacturer: Fluke

Description: Digital Multimeter

If this is not a multi-part test report, leave the "Part" field empty.

Figure 14

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MudCats: Untitled

File View Tools Options Administration Help

Master Mode: Data Collection

MudCats Calibration Process Manager

Active Active Active Active

Timer: 0:00 OLE: RB-222 As Found As Left All Cal Files Show Tolerance 100% of tol

Attach No: 1

Unit Script Var List GPIB Read

STEP NUM	FUNCTION TESTED	NOMINAL VALUE	AS FOUND	AS LEFT	Out of Tol	CALIBRATION TOLERANCE	Specificati
1							
1							
2							
3							
4							

Figure 12

MudCats: Fluke 8840A Multimeter (ECI-022, Attach No: 1)

File View Tools Options Administration Help

Master Mode: Data Collection

MudCats Calibration Process Manager

Active Active Active Active

SI-01052 0.000 mV

SI-02798 0.001 mV

As Found 0.001 As Left 0.000

As Found 0.005 As Left 0.001

Timer: 0:00 OLE: RB-222 As Found As Left All Cal Files Show Tolerance 100% of tol

Fluke 8840A Multimeter (ECI-022, Attach No: 1)

Unit Run Scripted Var List GPIB Read

STEP NUM	FUNCTION TESTED	NOMINAL VALUE	AS FOUND	AS LEFT	Out of Tol	CALIBRATION TOLERANCE	Specificati
1	4.3.1.4	DC Voltage 200.000 mV Range	0.000 mV	0.001		-0.004 to 0.004 mV	4:1
1	4.3.1.5	DC Voltage 200.000 mV Range	0.00000 V	0.00000		-0.00003 to 0.00003 V	4:1
1		20.000 V Range	0.0000 V	0.0000		-0.0003 to 0.0003 V	4:1
1		200.000 V Range	0.000 V	0.000		-0.003 to 0.003 V	4:1

Figure 13

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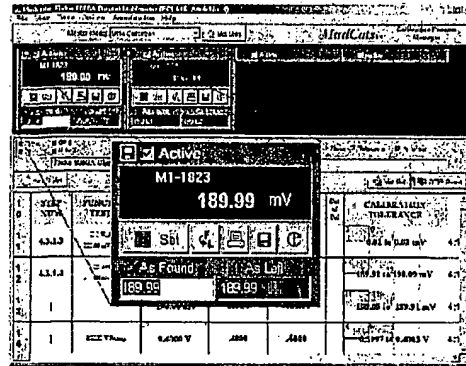


Figure 13A

MudCats: Fluke 8060A Digital Multimeter (ECI-815, Alich No. 4)

File View Tools Options Administration Help

Master Mode Data Sheet Designer MudCats Calibration Process Manager

Edit Cell: 43.2.4

STEP	FUNCTION TESTED	NOMINAL VALUE	AS FOUND	AS LEFT	CALIBRATION TOLERANCE
2	43.2.4	AC Voltage 200.00 mV Range	190.00 mV @ 10 kHz	190.00 millivolt 10 kilohertz	189.42 to 190.58 mV
2			190.00 mV @ 20 kHz	190.00 millivolt 20 kilohertz	188.65 to 191.35 mV
2			190.00 mV @ 50 kHz	190.00 millivolt 50 kilohertz	187.10 to 192.90 mV
2			190.00 mV @ 100 kHz	190.00 millivolt 100 kilohertz	182.30 to 197.70 mV
2		2 V Range	1.9000 V @ 40 Hz	1.9000 volt 40 hertz	1.8800 to 1.9200 V
2			1.9000 V @ 1 kHz	1.9000 volt 1 kilohertz	1.8895 to 1.9105 V
2			1.9000 V @ 1 kHz	1.9000 volt 1 kilohertz	1.8893 to 1.9107 V*
2			1.9000 V @ 10 kHz	1.9000 volt 10 kilohertz	1.8895 to 1.9115 V
2			1.9000 V @ 30 kHz	1.9000 volt 30 kilohertz	1.8770 to 1.9230 V
2			1.9000 V @ 50 kHz	1.9000 volt 50 kilohertz	1.8520 to 1.9480 V

Lock Status: Edit Mode

Tools: Copy, Paste, Clear, Copy symbol to clipboard, Units, Scripted (+), Special Ops, Same, Print Header, Page Break, Warnings, Reset All, Row level Remark Flag, Remark Flag

Figure 15

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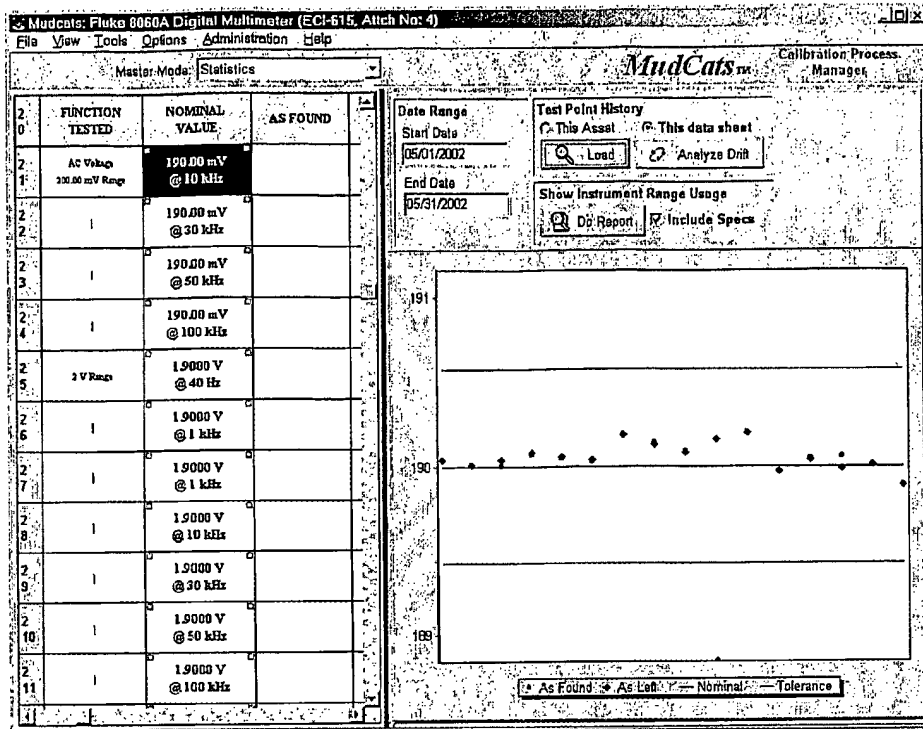


Figure 16

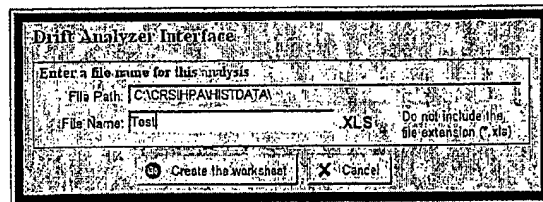


Figure 17

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PCT/US2003/028749

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Print Preview

Ftuke 8060A, Digital Multimeter Analysis Date: 01/13/2003

PUI: (5B9EBDA0-3403-4FAA-A71B-667CA09DA34C)		DUI: (2E62416-34E3-4D7C-B9D6-CD9F5C1378FC)		Data Sheet Date: 09/11/2002	
Average Interval: 188		Number In-Tolerance: 204		Observed Reliability: 81.828	
Longest Interval: 380		Number OOT: 45		Observed OOT Rate: 18.072	
Number of Tests: 249				Recommended Interval: 175	
Test Point Count: 63		TP Interval Mean: 388		TP Triggers (Plus): 0	
(Std Dev / Mean) %: 3.877		TP Interval Std Dev: 14.282		TP Triggers (Minus): 3	

Test Point Detail

Step #	Func Tested	Nominal Val	Calibration Tolerance
4.3.1.3	DC Voltage 200.00 mV Range	0.00 mV	-0.02 to 0.02 mV
Average Interval: 188		Number In-Tolerance: 241	Observed Reliability: 98.787
Longest Interval: 380		Number OOT: 8	Observed OOT Rate: 3.213
Number of Tests: 249		Recommended Interval: 371	
Delta Mean Interval (Days): 3		Delta Mean Interval (%): 1	Item is a TP Trigger No
4.3.1.4	DC Voltage 200.00 mV Range	190.00 mV	189.91 to 190.09 mV
Average Interval: 188		Number In-Tolerance: 241	Observed Reliability: 98.787
Longest Interval: 380		Number OOT: 8	Observed OOT Rate: 3.213
Number of Tests: 249		Recommended Interval: 371	
Delta Mean Interval (Days): 3		Delta Mean Interval (%): 1	Item is a TP Trigger No
		-190.00 mV	-190.09 to -189.91 mV

0% Page 45 of 152

Figure 17A

MudCats: Data Sheet Catalog

Data Sheet Catalog

Search for: SNA Do Search

Note: Pressing the Enter key in the "Search for" field will execute the search

Search Criteria: Manufacturer (Starts w)

Manufacturer	Model	Description	Procedure	Alt #	Approved Date	Approved By	Custom?	Spec?
Snap-on	QC5R1000	Torque Wrench	ECH-1303	30	5/8/2002 7:30:27 AM	BRENIARS	False	
Snap-on	QCE216	Digital Torque Wrench	ECH-1303	61	6/21/2002 1:37:49 PM	CASEYRL	False	
Snap-on	QD2R200	Torque Wrench	ECH-1303	45	5/17/2002 12:38:29 PM	CASEYRL	False	
Snap-on	QJ117B	Torque Wrench	ECH-1303	59	6/19/2002 8:38:10 AM	CASEYRL	False	
Snap-on	QTR2100	Torque Wrench	ECH-1303	29	5/7/2002 2:48:40 PM	BRENIARS	False	
Snap-on	TE25A	Torque Wrench	ECH-1303	48	6/11/2002 10:30:59 AM	CASEYRL	False	
Snap-on	TE50FUA	Torque Wrench	ECH-1303	32	5/8/2002 8:01:53 AM	BRENIARS	False	
Snap-on	TE6A	Torque Wrench	ECH-1303	55	6/19/2002 8:30:25 AM	CASEYRL	False	
Snap-on	TER175L	Torque Wrench	ECH-1303	31	5/8/2002 7:58:13 AM	BRENIARS	False	
Snap-on	TQJE101	Torque Sensor	ECH-1340	74	7/3/2002 9:24:39 AM	CASEYRL	False	

Specifications Reference Catalog Notes (to assist in selecting the correct data sheet version)

Group Members:

Procedure: ECH-1303 Alt # 30 Author: Revision Editor: Approved by: BRENIARS Approved on: 5/8/2002 7:30:27 AM

Model: QC5R1000 Manufacturer: Description:

Customer Specs: Permanent Unique ID (PUI): [BEEBAF44-5254-1106-AA15-00C04F33F02F] Dynamic Unique ID (DUI): [BEEBAF45-6254-1106-AA15-00C04F33F02F]

☐ Inactive Selected ☒ OK Use the selected data sheet ☐ Cancel Just go away ☐ Delete selected

Figure 18

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Document History
Fluke 8060A, Digital Multimeter

☐ Approve as revision ☐ Approve As new datasheet

Approving this datasheet will insert it into the datasheet database. Any previous version of this datasheet will marked "inactive".

Revision History

Active	Approved on	Approved by	Author	Cal Int (Days)	Spec Reference
True	5/9/2002 5:35:52	DIANDRM	DiAndriole	365	Manual 632661 3/62 Rev. 3 1/88
False	5/8/2002 2:35:53	DIANDRM	DiAndriole	365	Manual 632661 3/62 Rev. 3 1/88
False	5/8/2002 9:01:55	DIANDRM	DiAndriole	365	Manual 632661 3/62 Rev. 3 1/88
False	5/7/2002 12:17:45	DIANDRM	DiAndriole	365	Manual 632661 3/62 Rev. 3 1/88

Specifications Reference: Manual 632661 3/62 Rev. 3 1/88

Catalog Notes:

Procedure: All # Author: Revision Editor:

ECI615: DiAndriole

System Administrator Tools: ☐ Reactivate selected ☐ Inactivate all ☐ Delete selected

Figure 19

Data Sheet Group Selector

Group Boilerplate (Catalog Use Only)

Author: Manufacturer:

Revision Editor: Model Number: Procedure:

DDI 325 Description: Cal Interval: 0.00 Days

☐ Custom Spec

Spec Reference:

Catalog Notes:

Group Members

Part	Manufacturer	Model	Description

Cal Intvl: Specifications Reference: Catalog Notes:

Procedure: All # Author: Revision Editor: Approved by: Approved on:

Model: Manufacturer: Description:

☐ Customer Spec

☒ OK... Use the selected data sheet ☐ Cancel... Just go away

Figure 20

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Data Sheet Group Editor

Group Boilerplate (Catalog Use Only)

Author: Curt Casto Manufacturer: Nobody
 Revision Editor: Model Number: A192 Procedure: ECH0000
 Description: Sample Data Sheet Group Cal Interval: 90.00 Days
☐ Custom Specs

Spec Reference:
 Catalog Notes:

Group Members

Part	Manufacturer	Model	Description
1	Fluke	8840A	Multimeter
2	Fluke	8840A	Multimeter
3	Hewlett Packard	3458A	Multimeter

Cal Intvl: 90.00 Specifications Reference: Catalog Notes:

Procedure: ECH022 Att # Author: DIANDRM Revision Editor: DIANDRM Approved by: DIANDRM Approved on: 05/10/2002 11:00:32
 Model: 8840A Manufacturer: Fluke Description: Multimeter
☐ Customer Specs

Figure 21

Data Sheet Group History

Manufacturer Model Description

Approving this datasheet will insert it into the datasheet database. Any previous version of this datasheet will be marked inactive.

Revision History

Active	Approved on	Approved by	Author	Cal Int (Days)	Spec Reference
True	10/12/2002 1:20:33	CASTOCV	Curt Casto	90	

Specifications Reference: Catalog Notes:

Procedure: ECH0000 Att # Author: Curt Casto Revision Editor:

System Administrator Tools:

Figure 22

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MudCats: Data Sheet Catalog

Calibration History Catalog

Search for: Do Search Search Criteria:

Note: Pressing the Enter key in the "Search for" field will execute the search.

Test No.	Part	Asset No.	Manufacturer	Model	Description	Procedure	Alt #	Approved Date
1	01		Fluke	8840A	Multimeter	ECH-022	1	7/21/2002 8:49:25 PM
1	01		Fluke	8840A	Multimeter	ECH-022	1	7/11/2002 4:57:55 AM
1	01		Fluke	8840A	Multimeter	ECH-022	1	7/11/2002 4:54:11 AM
1	01		Fluke	8840A	Multimeter	ECH-022	1	7/11/2002 4:41:10 AM
379449	0	SI-01052	Fluke	8840A	Multimeter	ECH-022	1	7/2/2002 7:31:08 AM
z_Test_Cut	01		Fluke	8840A	Multimeter	ECH-022	1	6/24/2002 6:12:58 AM
377967	0	SI-01110	Fluke	8840A	Multimeter	ECH-022	1	5/20/2002 11:09:29 AM
377334	0	SI-02268	Fluke	8840A	Multimeter	ECH-022	1	5/10/2002 3:00:03 PM
377339	0	SI-01109	Fluke	8840A	Multimeter	ECH-022	1	5/10/2002 12:21:52 PM

Specifications Reference Catalog Notes (to assist in selecting the correct data sheet version)

Procedure: Alt #: Author: Revision Editor: Approved by: Approved on:

Model: Manufacturer: Description:

Customer Specs:

☐ Inactivate Selected ☒ OK, Use the selected data sheet ☐ Cancel, Just go away ☐ Defaults selected

Figure 23

Do an automatic search for Test No. or Do a manual search

Select a file:

- V:\PROJECTS\TECHNICAL\MUDCATS\VER 1-2\CalFiles\Leat1.MCF
- V:\PROJECTS\TECHNICAL\MUDCATS\VER 1-2\CalFiles\Other11.MCF
- V:\PROJECTS\TECHNICAL\MUDCATS\VER 1-2\CalFiles\Other11_Perf_02.mcf
- V:\PROJECTS\TECHNICAL\MUDCATS\VER 1-2\CalFiles\Other11_Perf_01.MCF
- V:\PROJECTS\TECHNICAL\MUDCATS\VER 1-2\CalFiles\Other11_Perf_005.MCF
- V:\PROJECTS\TECHNICAL\MUDCATS\VER 1-2\CalFiles\Other11_Perf_006.MCF
- V:\PROJECTS\TECHNICAL\MUDCATS\VER 1-2\CalFiles\Elec_Mtr1.MCF

☒ Accept ☐ Cancel

Figure 24

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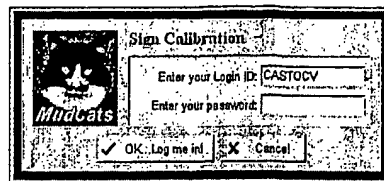


Figure 25

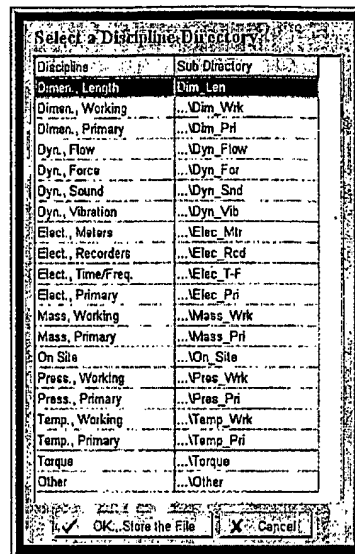


Figure 26



Figure 27

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Document History
Fluke 8060A Digital Multimeter (ECI-615, Atch No: 4)

Revision History

Active	Approved on	Approved by	Author	Cal Int (Days)	Spec/Reference
<input checked="" type="checkbox"/>	5/9/2002 5:35:52 PM	DIANDRM	DiAndriole	365	Manual 632661 3/82 Rev. 3 1
<input type="checkbox"/>	5/6/2002 2:35:53 PM	DIANDRM	DiAndriole	365	Manual 632661 3/82 Rev. 3 1
<input type="checkbox"/>	5/6/2002 9:01:55 AM	DIANDRM	DiAndriole	365	Manual 632661 3/82 Rev. 3 1
<input type="checkbox"/>	5/7/2002 12:17:48 PM	DIANDRM	DiAndriole	365	Manual 632661 3/82 Rev. 3 1

Specifications Reference
Manual 632661 3/82 Rev. 3 1/89

Catalog Notes

Procedure
ECI-615

Alt #
4

Author
DiAndriole

Revision Editor

Figure 28

Master Boiler Plate Data

Auto Insert into Tolerance Column ☐ TAR ☐ Measurement Uncertainty

Asset No: Test No: Part:

"Data Sheet" Document Information:

Author: DiAndriole

Revision Editor:

Use mixed case type for Manf. and Desc:

Manufacturer: Fluke

Model Number: 5700A/5700A Series II w/ 57

Description: Calibrator

Attachment No.: 1

Cal Proc: ECI-118

Cal Interval: 30.00 Days

Spec Reference: Custom Spec:

Document Pagination

Add to Front: Add to Back: Modify Document package page numbering (add pseudo pages). Does not effect Attachment page numbering.

Catalog Notes: 99% Confidence level

Remarks: (Symbol Synchronised)

Data Sheet Ops Commands

Use "Zero" for "± n %" Tolerances (1) 2 12

Use "Zero %" for "± n %" Tolerances (1)

Figure 29

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Remarks Editor

Remarks: (Symbol Synchronized)

* ☐ ☐

** ☐ ☐

*** ☐ ☐

**** ☐ ☐

***** ☐ ☐

* ☐ Range: 0 to 2000 inH₂O

* ☐ inH₂O Referenced to 20°C

* ☐ Accuracy: ± 0.05% F.S.

Note: Global Remarks will be printed on every page of the datasheets. Remarks that are not "Global" will be printed on each page that has the corresponding symbol placed at the end of the "Calibration Tolerance" column.

Example: (Calibration Tolerance Column) 119.025 to 120.075 mV

☐ Accept ☐ Cancel

Figure 30

Data Sheet Operations Commands

Measured Values

When recording measured values...

☒ Record measured values as "ppm" of "Nominal Value".
When the tolerance is stated as "± n ppm", ignore the declared "Nominal Value" and use "0 ppm" as the Nominal reference for comparison to the "Tolerance". I will be record ppm values only.

☐ Record measured values as "% of "Nominal Value".
When the tolerance is stated as "± n %", ignore the declared "Nominal Value" and use "0 %" as the Nominal reference for comparison to the "Tolerance". I will be record % values only.

☐ Accept ☐ Cancel

Figure 31

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Mudcats: Fluke 8060A Digital Multimeter (ECI-815, Atch No: 4)

File View Tools Options Administration Help

Master Mode: Data Sheet Designer MudCats Calibration Process Manager

Edit Cell: 190.00 mV @ 50 kHz

STEP	NUM	FUNCTION TESTED	NOMINAL VALUE	AS FOUND	AS LEFT	Cal of Tol	CALIBRATION TOLERANCE	
2	0							
2	1	43.24 AC Voltage 200.00 mV Range	190.00 mV @ 10 kHz	190.00 millivolt 10 kilohertz			189.42 to 190.58 mV	4:1 Req
2	2		190.00 mV @ 30 kHz	190.00 millivolt 30 kilohertz			188.65 to 191.35 mV	4:1 Req
2	3		190.00 mV @ 50 kHz	190.00 millivolt 50 kilohertz			187.10 to 192.90 mV	4:1 Req
2	4		190.00 mV @ 100 kHz	190.00 millivolt 100 kilohertz			182.30 to 197.70 mV	4:1 Req
2	5	1 V Range	1.9000 V @ 40 Hz	1.9000 volt 40 hertz			1.8800 to 1.9200 V	4:1 Req
2	6		1.9000 V @ 1 kHz	1.9000 volt 1 kilohertz			1.8095 to 1.9105 V	4:1 Req

Select Specification Types: ☒ % of LV, ☒ % of FS, ☒ Floor (Fixed Value), ☐ ± dB (Log), ☒ Custom

Nominal Val: Units of Measure: % of LV: FS Val: % of FS: Floor Val:

Multiple Test Points: Asymmetrical Tol:

Custom Calculation: Add % per Unit above a fixed value (the fixed value must < Nominal)

Units: In ppm: Operator: Decimals: 3: Calc: Recalc: Test Point Delimiters: / \

Lock Status: Edit Mode: Copy: Paste: Clear: Copy symbol to clipboard: Paste: Clear: Insert: Scripted (3): Delete: Add (5): Add Page: Group: Copy: Paste: Clear: Warnings: Reset All:

Figure 32

Datasheet Automatic Line Generator

Enter the text you would like to appear in the Columns:

Procedure Step No: 4.3.1

Function Tested: DC Voltage-2.2 V Range

✓ Ok... Create the Lines... X Cancel... Don't Create Squall

Figure 33

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Nominal Value Wizard

Units Groups: Angle, Plane; Angle, Solid; Area; Density; Electricity; Pressure and Velocity

Units of Measure: GV (gigavolt); MV (megavolt); KV (kilovolt); V (volt); mV (millivolt); μ V (microvolt); nV (nanovolt); pV (picovolt); fV (femtovolt); aV (attovolt); zV (zeptovolt); yV (yoctovolt)

Units by symbol: ☒

Parameters: Update from Unit; Add Param; Delete; Up; Down

Value	Symbol	Unit Group	Unit of Measure
190.000	mV	Electricity	volt: millivolt
40	Hz	Frequency	hertz: hertz

Set Nominal Val: 190.000

Source Nominal: 190.000 mV @ 40 Hz

Data Component: 190.000 mV @ 40 Hz

Trailing Text:

Composite Result: 190.000 mV @ 40 Hz

☒ Accept ☐ Cancel

Figure 34

Tolerance Column Editor

What should be included in the Tolerance Column?

TAR: Use Boiler Plate; Boilerplate: Not Included; Auto: ; User Declared:

Measurement Uncertainty: Use Boiler Plate; Boilerplate: Not Included; Auto: 0.0006077 %; 0.0011547 % U or M; User Declared:

Row Level Remark Flag: Remark Flag:

Note: User defined values will be used, if not left blank

Tolerance Info: 187.620 to 192.380 mV

Auto Data:

Trailing Text:

Composite: 187.620 to 192.380 mV

☒ Accept ☐ Cancel

Figure 35

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Units of Measure, by Symbol

Symbol	Unit of Measure
oz-in	ounce inch
pA	picoampere
pF	picoFarad
pH	picoHenry
pV	picoV
pVavg	picoV, average
pVpk	picoV, peak
pVpp	picoV, peak to peak

Find Symbol:

Figure 36

Wizard Loader

Locate Wizard Files:

Directory: V:\PROJECTS\TECHNICAL\MUDCATS VER 1.2\Wizards\Micrometers

Wizard Title	File Name	Author	Description
Micrometers (Outside)	Micrometer (OS).mwz	Curt V. Caslo	Micrometers (Outside)
Micrometers	mics.mwz	Curt Caslo	Generic Micrometers

Micrometer (OS).mwz
mics.mwz

Figure 37

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The Wizard Workshop Current File: V:\Project\Technical\ModData\Ver.1-2\Wizard\Elec\Misc\dmm

File Header: Note: Always use mixed case text! This will take up much less display space.

Wizard Title: DMM, Generic (x200) **Created by:** Curt Casto

Boiler Plate: **Description:** Generic templates for DMM's with a range base of 200 (i.e. 200mV Range)

Test Point Definitions: Note: You can use an alpha character to represent an exponent (10ⁿ = 10E-3)

Test Point Title	Step Number	Function Tested
µVDC Range	4.3.n	200µV DC-Range Tests
mVDC Range	4.3.n	200mV DC-Range Tests
VDC Range	4.3.n	2V DC-Range Tests
VDC Linearity	4.3.n	Linearity Tests
mVAC Range	4.3.n	200mV AC-Range Tests

Test Point Title: µVDC Range **EQ Step Num:** 4.3.n

Function Tested: 200µV DC-Range Tests

Test Point List: as % of 200

Norm. Val.	Units of Measure	% of LV	FS Val.	% of FS
µV	X		µV	X

☒ Multiple Test Points: ☐ ppm

☒ % of LV ☐ % of FS ☐ % of FS + Floor ☐ % of FS + Floor ☐ % of FS + Floor ☐ % of FS + Floor ☐ % of FS + Floor ☐ % of FS + Floor

☒ Lo to High: ☐ +/- n Units ☐ +/- n % ☐ +/- n ppm ☐ Fixed Decimals: ☐

Accept the changes to the test point.

Undo the changes to the test point.

Leave the Wizard's Workshop

Figure 38

Gauge: Compound Gauge Set default rules to: ☒ Analog ☐ Digital

☒ Use % Span (n% of Top & Bottom Scales combined) (Replaces % FS)

Top Scale: Units: psig Scale: 0 to 250 Full Scale: 250 % LV: 1 Floor Value: 0

Bottom Scale: Units: inHg(60°F) Scale: 0 to 30 Full Scale: 30 % LV: 1 Floor Value: 0 Max Test Point Value: 29.6

Span: 255 psig 1 % of Span

Top Scale Test Points:

No. of Decimals	No. of Points	Test Type	Inc	Dec
2	5	<input checked="" type="checkbox"/> Increasing <input type="checkbox"/> Decreasing	50.00	1
			100.00	
			150.00	
			200.00	
			237.50	
			200.00	
			150.00	

Bottom Scale Test Points:

No. of Decimals	No. of Points	Test Type	Inc	Dec
2	2	<input checked="" type="checkbox"/> Increasing <input type="checkbox"/> Decreasing	15.00	1
			20.50	
			15.00	

Function Tested: Positive Pressure Negative Pressure

OK, Create the data set. No more data sets

Figure 39

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Measurement Uncertainty Wizard

☒ Use System Default

Nominal Value: 20.000 mV

Note: All uncertainty entries are 1 standard deviation ($k=1$) based.

Type A

TAR	Description	Sens. Coeff.	Uncertainty ($k=1$)

Type B

☒ Auto Include Standards Uncertainty

☒ Auto Include Resolution Uncertainty

☐ Value ☐ Override

TAR	Description	Sens. Coeff.	Uncertainty ($k=1$)
X	Fluke 6700A & 6700A Series II and a 5725A Programmable	1.000	0.00062 mV
	Resolution	1.000	0.00058 mV

$k = 2.00$ Coverage Factor $EMU = 0.0017$ mV

Figure 40

Uncertainty Element Editor

Description: Temperature Compensation

Sense Coeff: 0.25

Value ($k=1$): 0.0012 mV

☐ Include Element in TAR Calculations

Note: All uncertainty entries are 1 standard deviation ($k=1$) based.

Figure 41

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MudCats: Fluke 8060A Digital Multimeter (ECN:515, Attach No: 4)

File View Tools Options Administration Help

Master Mode: Data Sheet Designer

MudCats Calibration Process Manager

Edit Cell: 190.00 mV @ 50 kHz

STEP	NUM	FUNCTION TESTED	NOMINAL VALUE	AS FOUND	AS LEFT	Cal. Tolerance	Req.
2	0						
2	1	4.32.4 AC Volts 200.00 mV Range	190.00 mV @ 10 kHz	190.00 millivolt 10 kilohertz	189.42 to 190.58 mV	4:1 Req.	
2	2		190.00 mV @ 30 kHz	190.00 millivolt 30 kilohertz	188.65 to 191.35 mV	4:1 Req.	
2	3		190.00 mV @ 50 kHz	190.00 millivolt 50 kilohertz	187.10 to 192.90 mV	4:1 Req.	
2	4		190.00 mV @ 100 kHz	190.00 millivolt 100 kilohertz	182.30 to 197.70 mV	4:1 Req.	
2	5	2 V Range	1.9000 V @ 40 Hz	1.9000 volt 40 hertz	1.8800 to 1.9200 V	4:1 Req.	
2	6		1.9000 V	1.9000 volt 1 kilohertz	1.8895 to 1.9105 V	4:1 Req.	

Configure Instrumentation with SpecTrack Data

Std. Used: Def. Std.: Myself

Instrument Ranges: Fluke 5700A & 5700A Series II and II Programmable Calibration (0.03626% Voltage AC: 22 mV to 19.9999 mV @ 20 Hz to 50 kHz)

Instrument Sync Parameters: 190 mV (millivolt) 50 kHz (kilohertz)

Auto Assign: Auto Assign to TP Manual Assign to TP Remove from TP

Figure 42

MudCats: Fluke 8060A Digital Multimeter (ECN:515, Attach No: 4)

File View Tools Options Administration Help

Master Mode: Data Sheet Designer

MudCats Calibration Process Manager

Edit Cell: 190.00 mV @ 50 kHz

STEP	NUM	FUNCTION TESTED	NOMINAL VALUE	AS FOUND	AS LEFT	Cal. Tolerance	Req.
2	0						
2	1	4.32.4 AC Volts 200.00 mV Range	190.00 mV @ 10 kHz	190.00 millivolt 10 kilohertz	189.42 to 190.58 mV	4:1 Req.	
2	2		190.00 mV @ 30 kHz	190.00 millivolt 30 kilohertz	188.65 to 191.35 mV	4:1 Req.	
2	3		190.00 mV @ 50 kHz	190.00 millivolt 50 kilohertz	187.10 to 192.90 mV	4:1 Req.	
2	4		190.00 mV @ 100 kHz	190.00 millivolt 100 kilohertz	182.30 to 197.70 mV	4:1 Req.	
2	5	2 V Range	1.9000 V @ 40 Hz	1.9000 volt 40 hertz	1.8800 to 1.9200 V	4:1 Req.	
2	6		1.9000 V	1.9000 volt 1 kilohertz	1.8895 to 1.9105 V	4:1 Req.	

Configure Instrumentation with SpecTrack Data

Std. Used: Def. Std.: Myself

Instrument Ranges: Fluke 8060A Digital Multimeter (0.03626% Voltage AC: 0 mV to 1.9999 V @ 20 Hz to 45 Hz)

Instrument Sync Parameters: 1.9 V (volt) 40 Hz (hertz)

Auto Assign: Auto Assign to TP Manual Assign to TP Remove from TP

Figure 43

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Configure Instrumentation with SpectTrack Data

Instruments

Instrument	Asset ID	Range	Unit	Accuracy	Resolution	Cal. Due
Fluke 5700A & 5700A Series II (50 Day) Programmable Calibrator						

Instrument Ranges

Range	Unit	Accuracy	Resolution
100 mV (milli)	V	0.03825%	22 mV to 219.9999 mV
50 kHz (kilohertz)	Hz		20 kHz to 50 kHz

Instrument Synchron Parameters

JUT Acc	1.5%
Std Acc	0.038%
TAR	33
EMU	0.054%

Buttons: Add, Remove, Replace selected with, Auto assign, Set "Used" as Default, Auto Assign to TP, Manual Assign to TP, Remove from TP, Reset Synchron Parameters, This TP, All TPs.

Figure 44

Configure Instrumentation with SpectTrack Data

Instruments

Instrument	Asset ID	Range	Unit	Accuracy	Resolution	Cal. Due
Fluke 5700A & 5700A Series II (50 Day) Programmable Calibrator						

Instrument Ranges

Range	Unit	Accuracy	Resolution
100 mV (milli)	V	0.03825%	22 mV to 219.9999 mV
50 kHz (kilohertz)	Hz		20 kHz to 50 kHz

Instrument Synchron Parameters

JUT Acc	1.5%
Std Acc	0.038%
TAR	33
EMU	0.054%

Buttons: Add, Remove, Replace selected with, Auto assign, Use Default, Auto Assign to TP, Manual Assign to TP, Remove from TP, Reset Synchron Parameters, This TP, All TPs.

Figure 45

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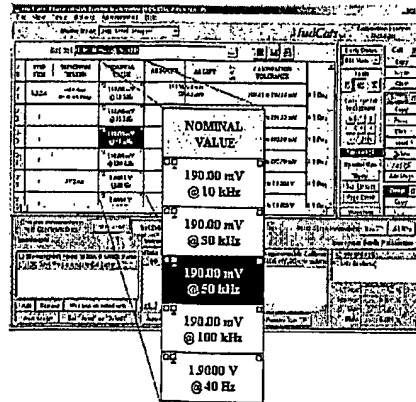


Figure 46

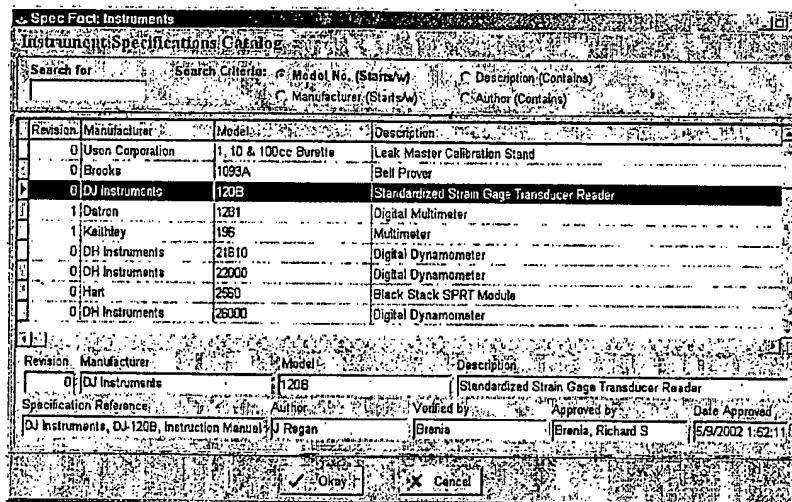


Figure 47

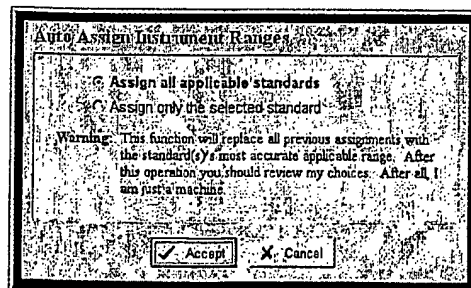


Figure 48

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Instrument Range Selector ☒ Show only ranges that match all critical criteria

Standards ☐ Fluke 5700A & 5700A Series II and a 5725A Programmable Calibrator

Functions
☒ \pm V Voltage, AC
☒ \pm V Voltage, AC (5725A Amplifier)
☒ \pm V Voltage, AC (Wideband)

Ranges
 [0.30263%] 0 mV to 330 mV, 30 Hz to 500000 Hz
 [0.48053%] 0 V to 3.3 V, 30 Hz to 500000 Hz
 [0.48316%] 0 V to 3.5 V, 30 Hz to 500000 Hz

Range Details
 Param: 0 mV to 330 mV, 30 Hz to 500000 Hz
 Specs: [90 day] Accuracy: $\pm 0.2\%$ I.V. ± 0.0005 V

Composite selection of standards for this test point
 Fluke 5700A & 5700A Series II and a 5725A Programmable Calibrator
 [0.015263%] Voltage, AC, 200 mV @ 10 Hz to 20000 Hz

Standards Search Criteria
 190 mV (full scale)
 10 kHz (kilohertz)

Function: AC Voltage, 200.00 mV Range
 Nominal: 190.00 mV @ 10 kHz
 TP Accuracy: $\pm 0.305263\%$

Remove Range
 Accuracy (RSS): 0.0152632 %

☒ Close

Figure 49

Instrument Substitution

Replace: Fluke 5100 Series B Calibrator

With: Fluke 5700A & 5700A Series II and a 5725A Programmable Calibrator

Note: This operation will attempt to use the selected standard in place of the standard being replaced, everywhere it is used. If the new standard does not have an applicable range for a test point, the reference to the replaced standard will still be removed.

Warning: You should review all test points after this operation to ensure my selections are appropriate to the test point application. After all, I will select ranges that meet my requirements, but the question is do they meet yours?

☒ Accept ☐ Cancel

Figure 50

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Set Instrument Asset ID's

Use this form to assign Asset Numbers to the standards used to perform this calibration. To Add, Remove, or Substitute standards, or assign Standards to test points, use the Main Form's "Configure Instrumentation with SpecTrack Data" section. Click on the "Configure Data Sheet Standards" button below to go there now.

(Unassigned) Fluke 5700A & 5700A Series II and
(30 Day) Programmable Calibrator

Asset No
S1-01688

✓ Accept X Cancel

Figure 51

Automation Command Editor

Command Editor: Command: SPIB Write

Parameter List: Group: Join All Groups

Parameter	Value
Addr	(5700)
Cmd	OUT DV, 0Hz

Use the Command Wizard

✓ Accept X Cancel

User Defined Variable List

Copy var name

Name	Value
F5700A Ref Out	18999276
UUT Meas Value	18999100
UUT Nominal	19a6
5700	4
8840A	2
Ac_HiVol_LoHz	20
Ac_HiVol_HiHz	10
Ac_LoVol_LoHz	20
Ac_LoVol_HiHz	7
Relative_Volt	5
De_LoVol	5
De_HiVol	6
PostVol	6
Ohms_Lo	5
Relative_Ohms	5

Figure 52

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Datasheet Variable Status	
Name	Value
F5700A Ref Out	18999276
UUT Meas Value	18999100
UUT Nominal	19u6
5700	4
8840A	2
Ac_HiVol_LoHz	20
Ac_HiVol_HiHz	10
Ac_LoVol_LoHz	20
Ac_LoVol_HiHz	7
Relative Volt	5

Figure 53

User Defined Variable Editor	
Variable Name:	F5700A Ref Out
Default Value:	18999276
<input checked="" type="checkbox"/> Accept <input type="checkbox"/> Cancel	

Figure 54

Command Group Editor	
Command Group Editor	System Group List
Menu Key: Group Name:	Configure (Default Key: "U")
Execute Step(System)	Energize (Default Key: "7")
Join All Groups(System)	De-energize (Default Key: "8")
Configure(System)	Execute Step (Default Key: "8")
	Measure (Default Key: "5")
	Join All Groups
	Script Startup Cmds
	Script Terminate Cmds
Group Name: Configure	Keypad Exec (0-9) 0
<input checked="" type="checkbox"/> <input type="checkbox"/>	
<input type="button" value="Close"/>	

Figure 55

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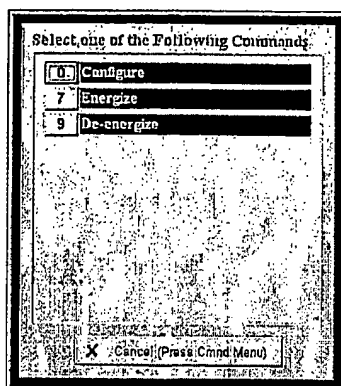


Figure 56

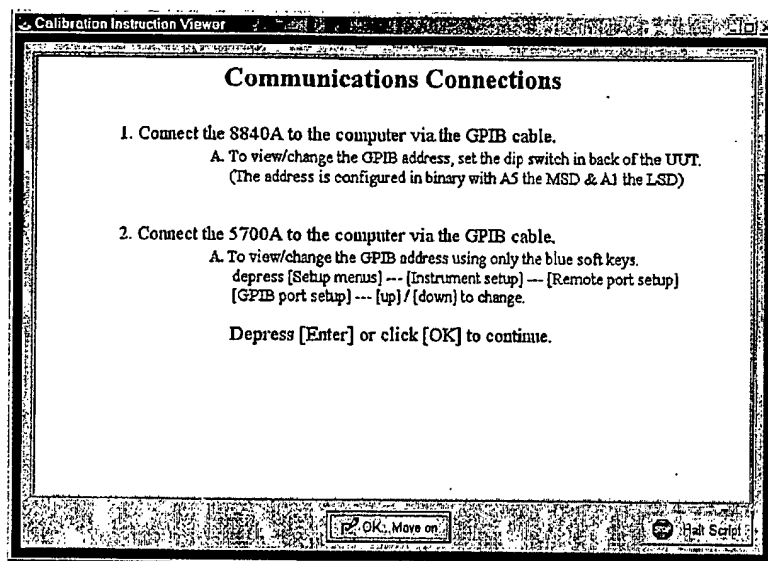


Figure 57

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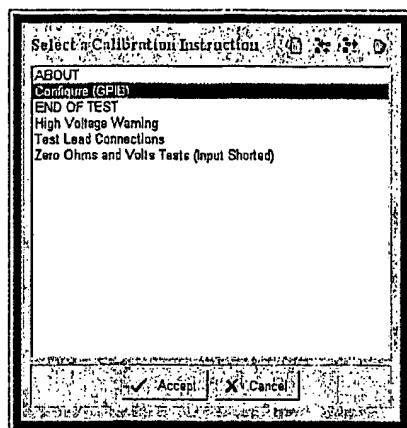


Figure 58

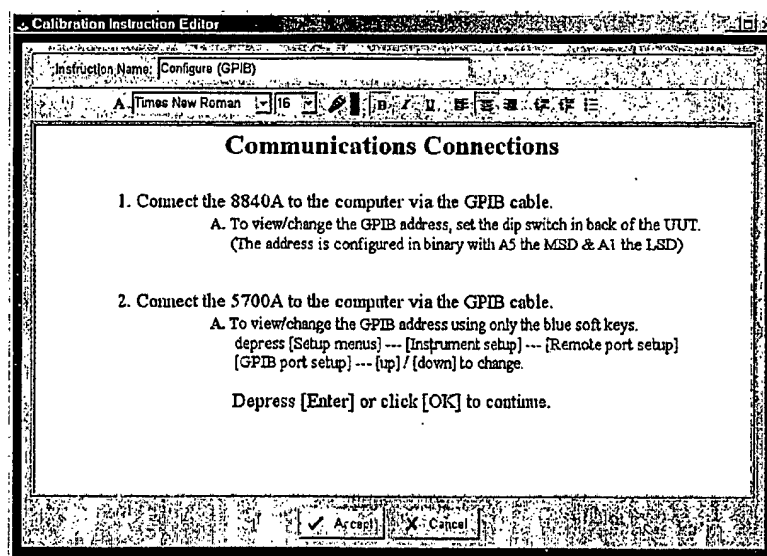


Figure 59

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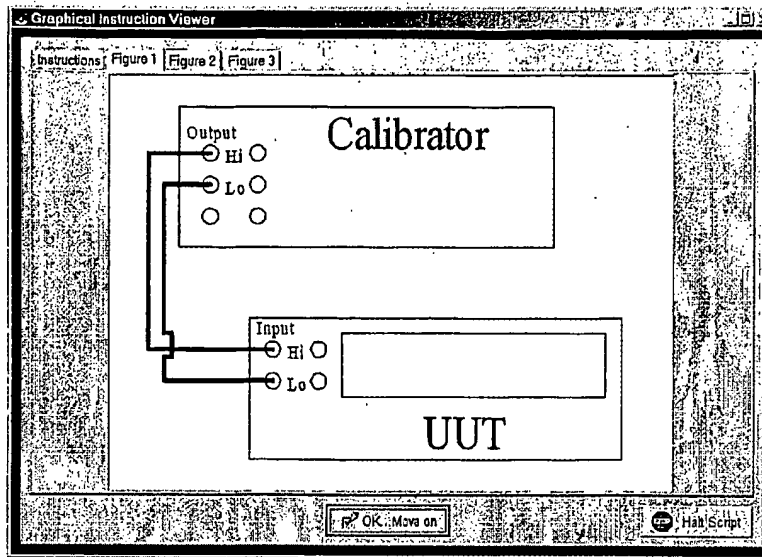


Figure 60

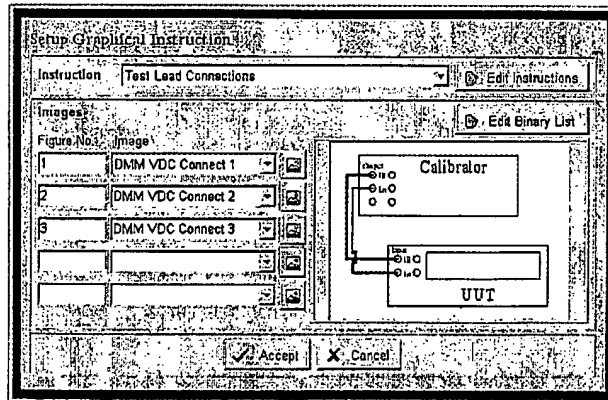


Figure 61

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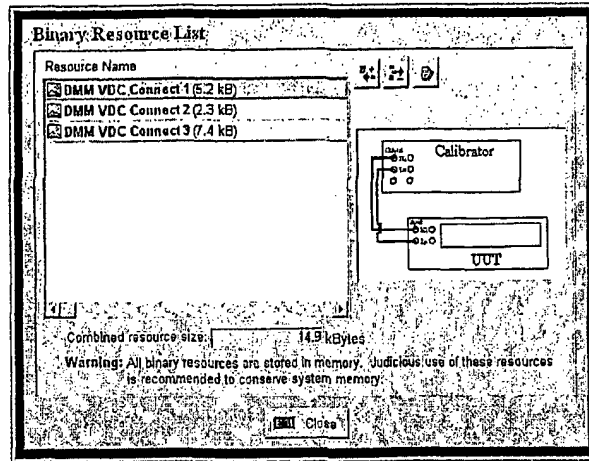


Figure 62

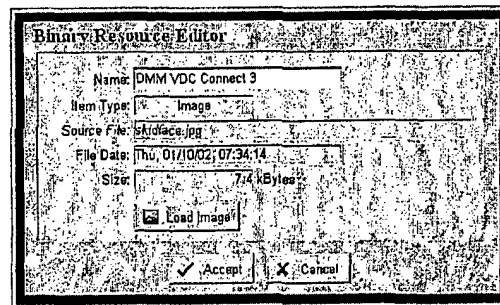


Figure 63

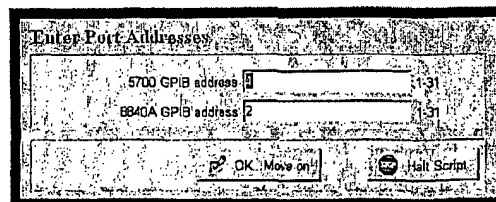


Figure 64

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Enter Port Addresses

Title: Enter Port Addresses

Caption*	Target Variable*	Default Val	Tell
5700 GPIB address	5700	4	{1-31}
8840A GPIB address	8840A	2	{1-31}

Required fields

☒ Accept ☒ Cancel

Figure 65

GPIB Write Command Wizard

☒ Send Command ☐ Command: Cur_Post Normal

GPIB Address: 4 {1-31}

☒ Fetch Response ☐ Command:

☐ Run Continuous Buffer Size: 100 The max number of Chars to Receive

>Direct Response<

Initial string format

Cut Left: Remove n characters from the left side of the response string (-1 = None)

Keep Left: Retain the n most left characters (After Cut Left -1 = All)

Final numeric result format

Exponent: Force the numeric format to use this exponent

Decimals: Use n decimal places in the numeric format (0-9)

Only parameters for the command being edited will be updated. The other options are displayed here to allow you to test your command configuration.

☒ Accept these command parameters ☒ Cancel

Figure 66

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"RS232_ReadToMeasure" Command Wizard

☒ Send Command ☐ Command:

☒ Fetch Response ☐ Command:

☐ Run Continuous ☐ Direct Response:

Initial string format:

Cut Left: Remove n characters from the left side of the response string [-1 = None]

Keep Left: Retain the n most left characters (After Cut Left) [-1 = All]

Final numeric result format:

Exponent: Force the numeric format to use this exponent

Decimals: Use n decimal places in the numeric format [0 - 9]

☒ Configure Port

Com Port: COM1

Baud Rate: 9600

Parity: NONE

Data Bits: 8BITS

Stop Bits: 1BITS

HW Handshake: NONE

SW Handshake: NONE

TX Prefix: None

TX Termination: CRLF

Rx Termination: CRLF

Rx Time Out: 6

Only parameters for the command being done will be updated. The other options are displayed here to allow you test your command configuration.

☒ Accept these command parameters ☐ Cancel

Figure 67

Com Port Setup

Com Port: COM2

Baud Rate: 9600

Parity: NONE

Data Bits: 8BITS

Stop Bits: 1BITS

HW Handshaking: NONE

SW Handshaking: NONE

TX Prefix: None

TX Termination: CRLF

Rx Termination: CRLF

Rx Time Out: 5 1 - 100 Secs

☒ Accept ☐ Cancel

Figure 68

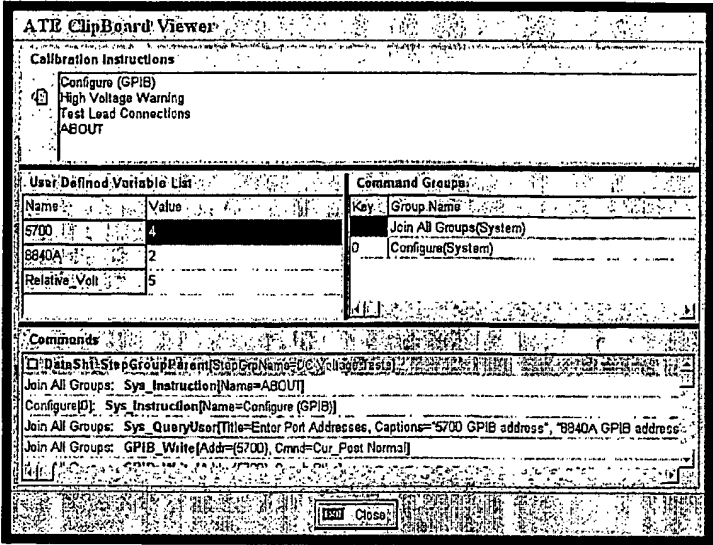


Figure 69

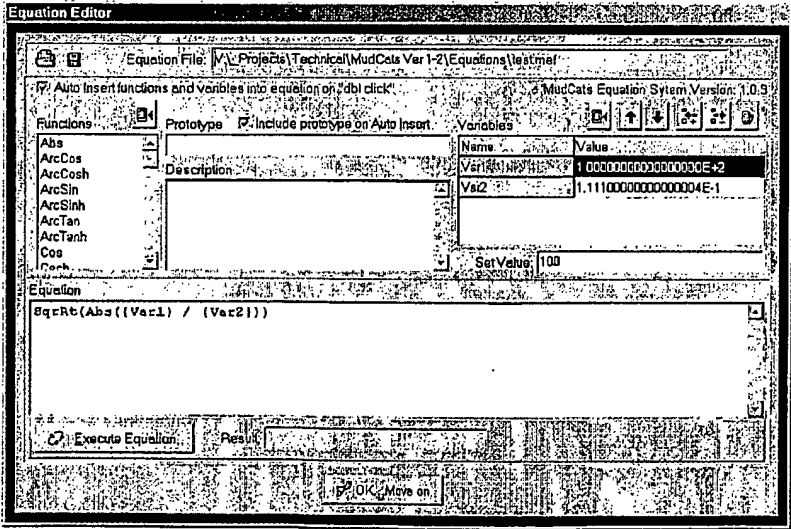


Figure 70

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Equation Variable Editor

Variable Name:

Default Value:

Figure 71

CustomCalcSetup_Frm

Custom Calculator Workshop

File: \\V\Projects\Technical\MudCat's Var 1-2\Calcs\Pct per unit above threshold.mcc

Calculator Name: Author: Version:

Calculator Used Queries

Caption	Target Variable	Default Val	Tail
Fixed Value (Threshold)	Threshold		U of M
Add n% per unit > fixed Val	PctPerUnit		%

System Variables

Name	Value
Sys_Nominal	0
Sys_Result	0

Custom Calculator Variables

Name	Value
Threshold	600
PctPerUnit	0.015
Thresh Tol	0

Set Value: 0

Use as Equation Target

Equation Steps

Variable	Equation
Thresh Tol	$= \text{if} ((\text{Sys_Nominal}) > (\text{Threshold})) \text{ then } ((\text{Sys_Nominal}) - (\text{Threshold})) * (\text{PctPerUnit}) * 0.01 \text{ else } 0$

Calculator Testing

Uninitialized Sys_Nominal variable

Nominal Value: Exec: All

Custom Calculator results are treated as +/- n Units of Measure

Result:

Figure 72

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Enter the following values:

Title:

Caption*	Target Variable*	Default Val	Tail
Fixed Value (Threshold)	Threshold		U of M
Add n% per unit > fixed Val	PctPerUnit		%
<input type="text"/>	<input type="text"/>		
<input type="text"/>	<input type="text"/>		
<input type="text"/>	<input type="text"/>		
<input type="text"/>	<input type="text"/>		
<input type="text"/>	<input type="text"/>		
<input type="text"/>	<input type="text"/>		
<input type="text"/>	<input type="text"/>		

* Required fields

Figure 73

Equation Variable Editor

Variable Name:

Default Value:

Figure 74

GPIB Interactive

Command:

GPIB Address: [1-31]

Command:

☐ Run Continuous Buffer Size: The max number of Chars to Receive

☐ Direct Response:

Initial string format:

Cut Left: Remove n characters from the left side of the response string (-1 = None)

Keep Left: Retain the n most left characters (After "Cut Left") (-1 = All)

Final numeric result format:

Exponent: ☒ Force the numeric format to use this exponent

Decimals: Use n decimal places in the numeric format (0-9)

Figure 75

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RS-232 Interactive

Send Command ☐ Command:

Fetch Response ☐ Command:

Run Continuous ☐ Response:

Initial string format:

Cut Left: Remove n characters from the left side of the response string (1 = None)

Keep Left: Retain the n most left characters (After 'Cut Left') (1 = All)

Final numeric result format:

Exponent: Force the numeric format to use this exponent

Decimals: Use n decimals places in the numeric format (0 - 9)

Configure Port ☐

Com Port: COM2	Parity: NONE	TX Prefix: None
Baud Rate: 9600	Data Bits: 8BITS	TX Termination: CRLF
	Stop Bits: 1BITS	Rx Termination: CRLF
	HW Handshake: NONE	Rx Time Out: 5
	SW Handshake: NONE	

Figure 76

HTML Table Generator

This operation will create a table and place it on the MS Windows clipboard.

What should I use to create the table?

☐ Use the entire datasheet

☐ Use the selected rows and applicable header row

☐ Use the selected rows

☒ OK - Create the table ☐ Cancel

Figure 77

Tab Delimited Table Generator

This operation will create a table and place it on the MS Windows clipboard.

What should I use to create the table?

☐ Use the entire datasheet

☐ Use the selected rows and applicable header row

☐ Use the selected rows

☒ OK - Create the table ☐ Cancel

Figure 78

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Unit Groups	Source Units	Target Units
Angle, Plane	ångström	ångström
Angle, Solid	astronomical unit	astronomical unit
Area	centimeter	centimeter
Density	femto	femto
Electricity	foot	foot
Energy and Work	inch	inch
Flow, Mass	kilometer	kilometer
Flow, Volume	meter	meter
Force	microninch	microninch
Frequency	micrometer	micrometer
Heat	micron	micron
Length	mil	mil

☐ Show Only Base Units

Significant Digits:

Source Units	Symbol	<input type="checkbox"/> SI Unit <input type="checkbox"/> Metric
meter	m	

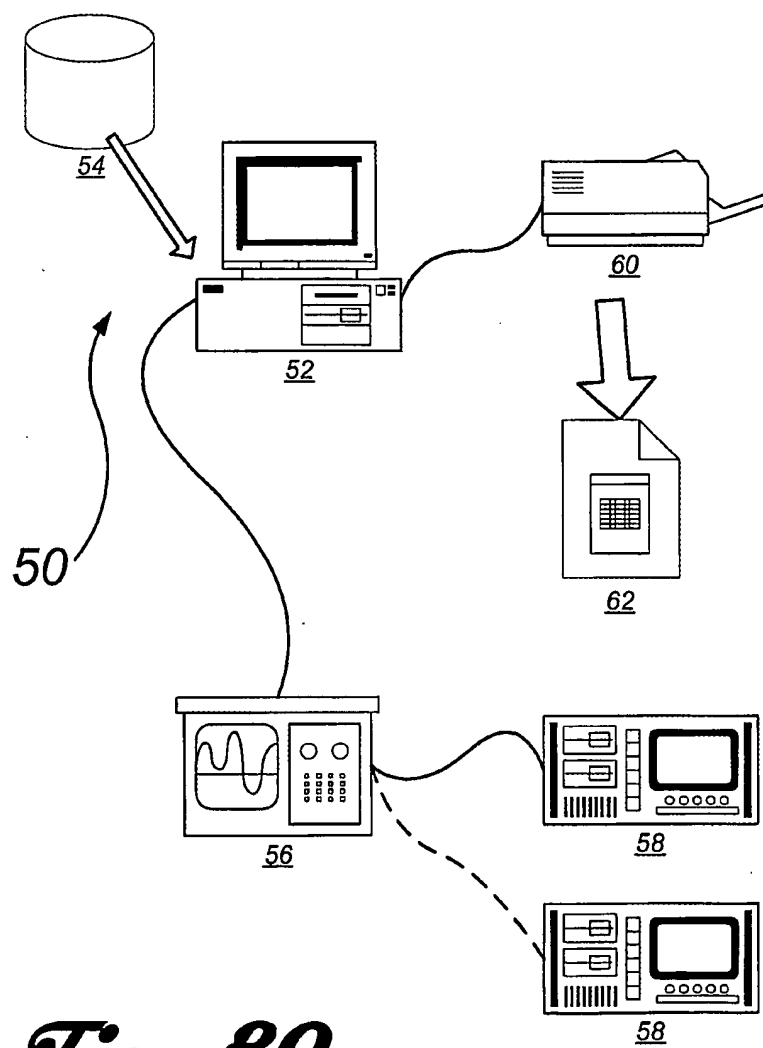
Equation: Precision: ☒ Exact ☐ Approved For: ☒ All Use ☐ Conversion Only

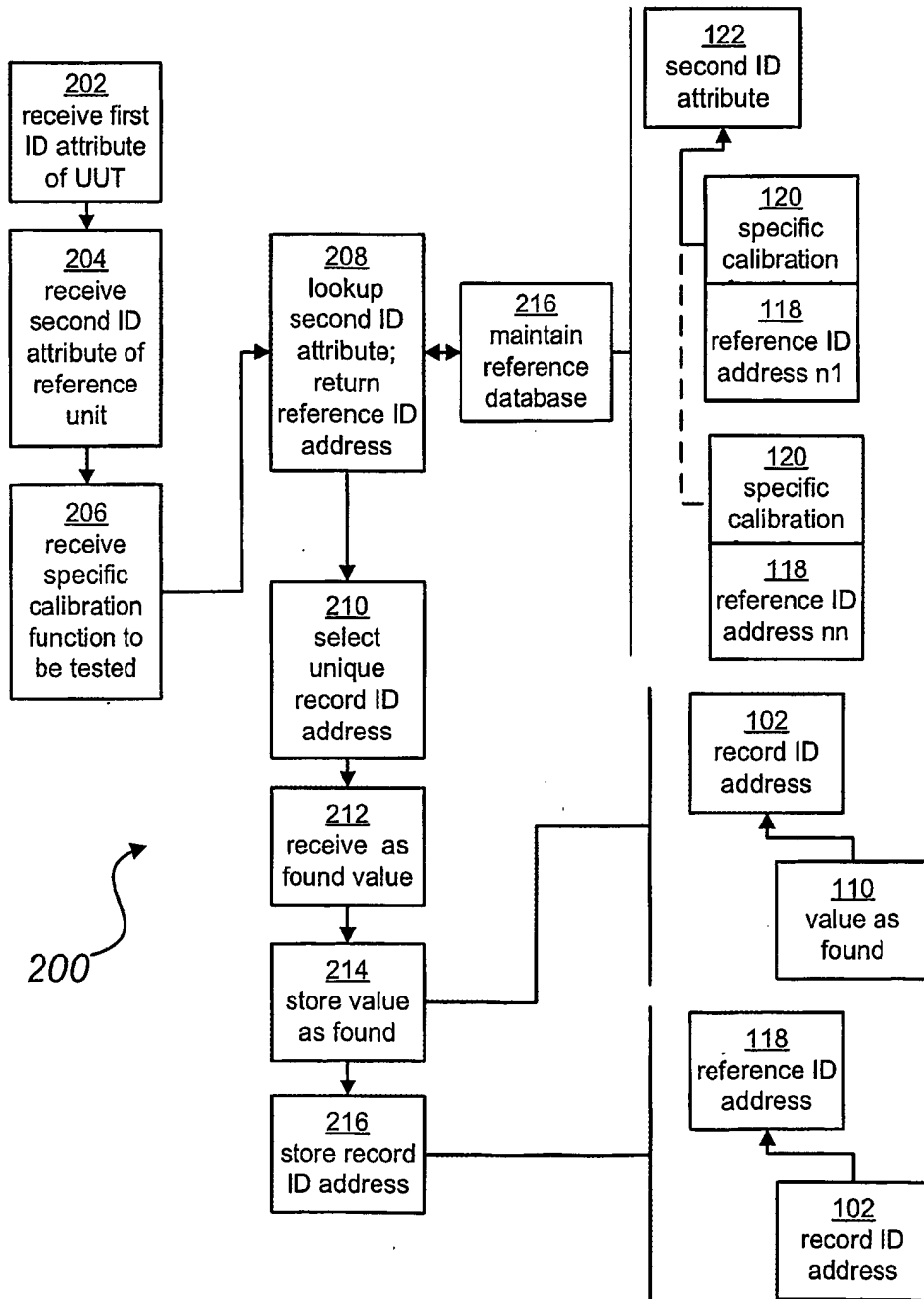
Target Units	Symbol	<input type="checkbox"/> SI Unit <input type="checkbox"/> Metric
foot	ft	

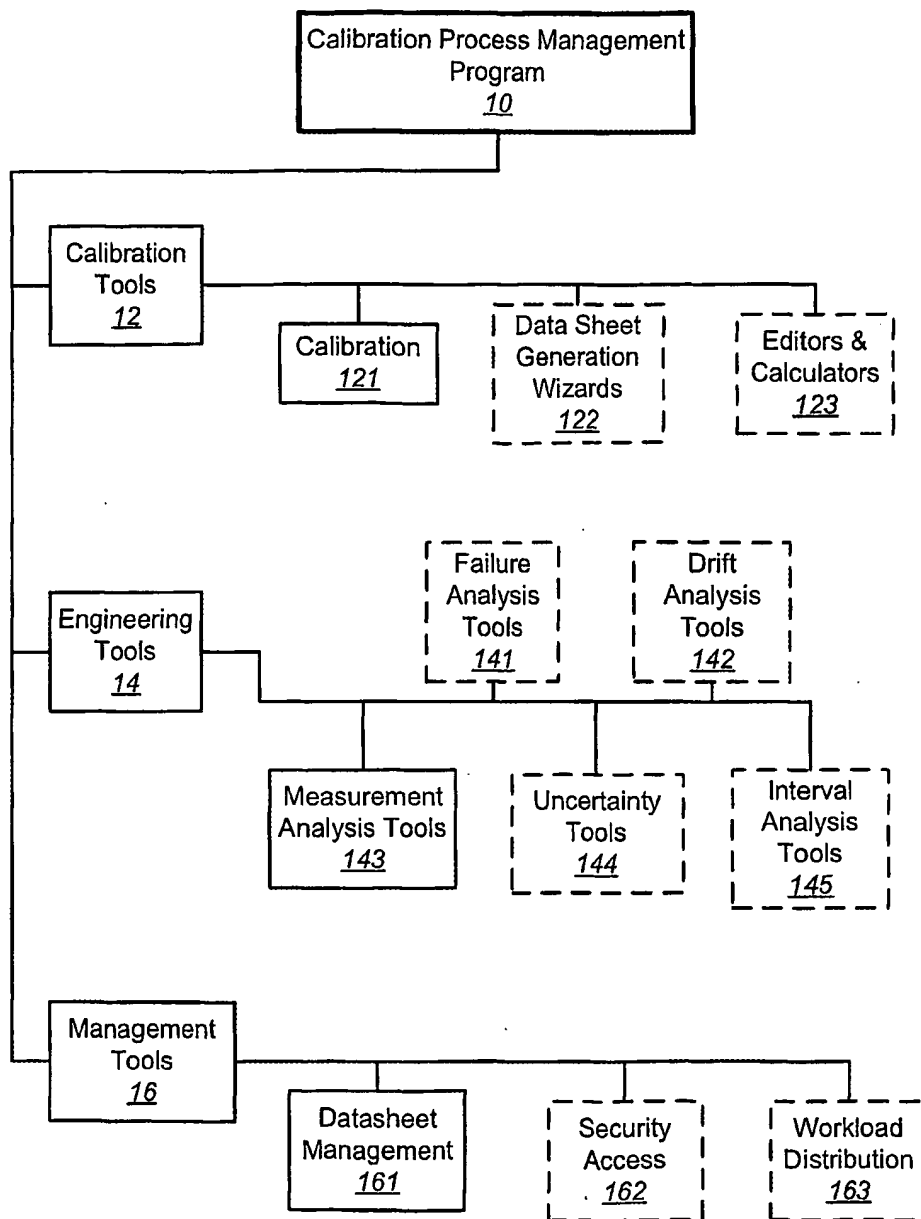
Equation: Precision: ☒ Exact ☐ Approved For: ☒ All Use ☐ Conversion Only

Figure 79

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**Fig. 80**

*Fig. 81*

*Fig. 82*

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Calibration Report

Test Number 372896
ID No. 8031008

Fluke 787 Process Meter

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STEP NUM	FUNCTION TESTED	NOMINAL VALUE	AS FOUND	AS LEFT	Out of Tol	CALIBRATION TOLERANCE
	DC Voltage 400.0 mV Range	0.0 mV	0.0			-0.1 to 0.1 mV
	DC Voltage 400.0 mV Range	390.0 mV	390.0			389.6 to 390.4 mV
	4.000 V Range	1.000 V	1.000			0.998 to 1.002 V
		2.000 V	2.000			1.997 to 2.003 V
		3.000 V	3.000			2.996 to 3.004 V
		3.900 V	3.900			3.896 to 3.904 V
	40.00 V Range	39.00 V	39.00			38.96 to 39.04 V
	400.0 V Range	390.0 V	390.0			389.6 to 390.4 V
	1000 V Range	900 V	900			899 to 901 V
	AC Voltage 400.0 mV Range 45 Hz	380.0 mV	378.4			375.1 to 384.9 mV
	AC Voltage 400.0 mV Range 60 Hz	380.0 mV	379.7			377.0 to 383.0 mV
	500 Hz	380.0 mV	369.7			353.0 to 407.0 mV
	4.000 V Range 45 Hz	3.800 V	3.784			3.751 to 3.849 V
	60 Hz	3.800 V	3.794			3.770 to 3.830 V
	500 Hz	3.800 V	3.692			3.530 to 4.070 V
	40.00 V Range 45 Hz	38.00 V	37.84			37.51 to 38.49 V

Remarks: Source document M007398.
1 year 18° to 28°C specifications.MetCal: Version 1.1, Southern California Edison
F:\METROLOGY\MAS\TMDAS\Doc\Sho\PENDING_R_OF_CAL\FLUKE\787\787.MS
F:\METROLOGY\MAS\TMDAS\Cal\Fluke\Sim_M0A1721\MANCF

ATTACHMENT 1

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Report

Fig. 83